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UNITED STATES DEPARTMENT OF AGRICULTURE
MISCELLANEOUS PUBLICATION NO. 69

WASHINGTON, D. C. JANUARY, 1930

CONSTRUCTION OF A SLED-TYPE CORNSTALK SHAVER

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One of the effective methods of controlling the European corn borer is the burning of the infested cornstalks before May 15. The stalks must be broken or cut off at ground level and raked into piles or windrows. It is important that all of the stalks, stubble, and trash be destroyed. The practice of winter poling—dragging a heavy log or railroad iron sidewise across the field to break off the stalks—usually leaves many of them still firmly rooted in the ground. If clean raking is to be done the stalks must all be cut free. To accomplish this a simple stalk shaver has been developed. (Fig. 1.) Repeated tests of this device under a wide variety of field conditions have given excellent results.

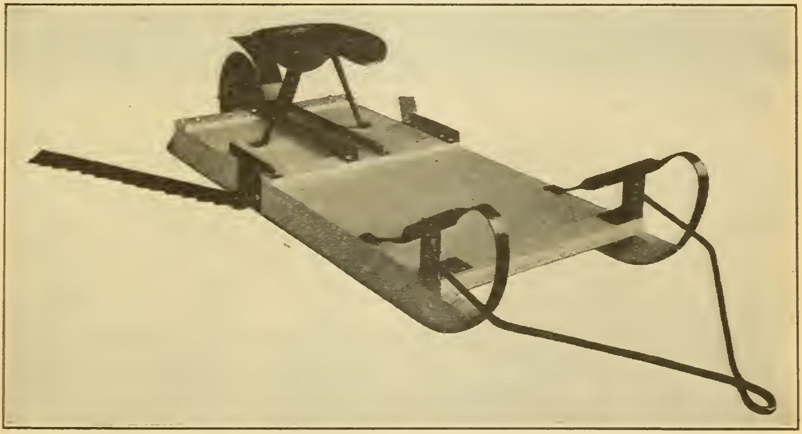

FIGURE 1.—A light 2-row cornstalk shaver, sled type

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[1] Recognition is given here to the farmers, county agents, and engineers who have contributed valuable ideas, and to the authors of the following publication: SILVER, E. A., and BARDEN, R. D. SOME SUGGESTIONS FOR THE CONSTRUCTION AND USE OF STALK SHAVERS. Ohio Agr. Col. Ext. European Corn Borer Leaflet 14, illus., 1928.

The chief advantages of this stalk shaver are its simple construction, light weight, light draft, low cost, and the possibility of placing two of the shavers abreast for cutting four rows of stalks at one time. The 2-shaver unit may be pulled by three horses or a light tractor,

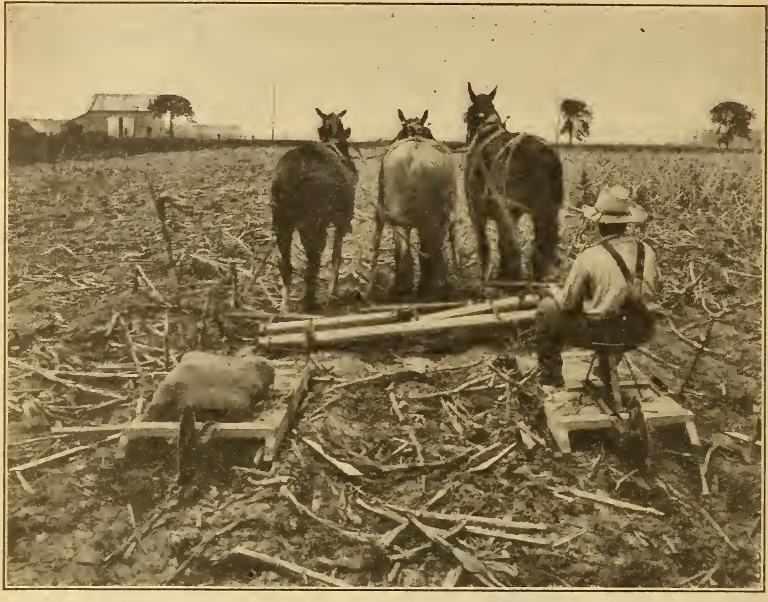

FIGURE 2.—Cutting four rows of cornstalks with two light stalk shavers drawn by three horses

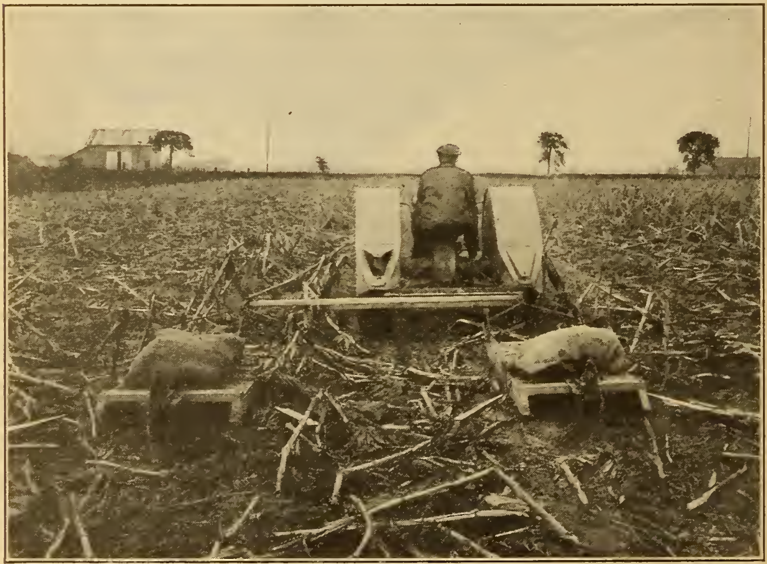

FIGURE 3.—Cutting four rows of cornstalks with two light stalk shavers drawn by a tractor

(Figs. 2 and 3.) The parts for the shaver are of simple design, and can easily be made in a farm shop that is equipped with a few blacksmith and wood-working tools.

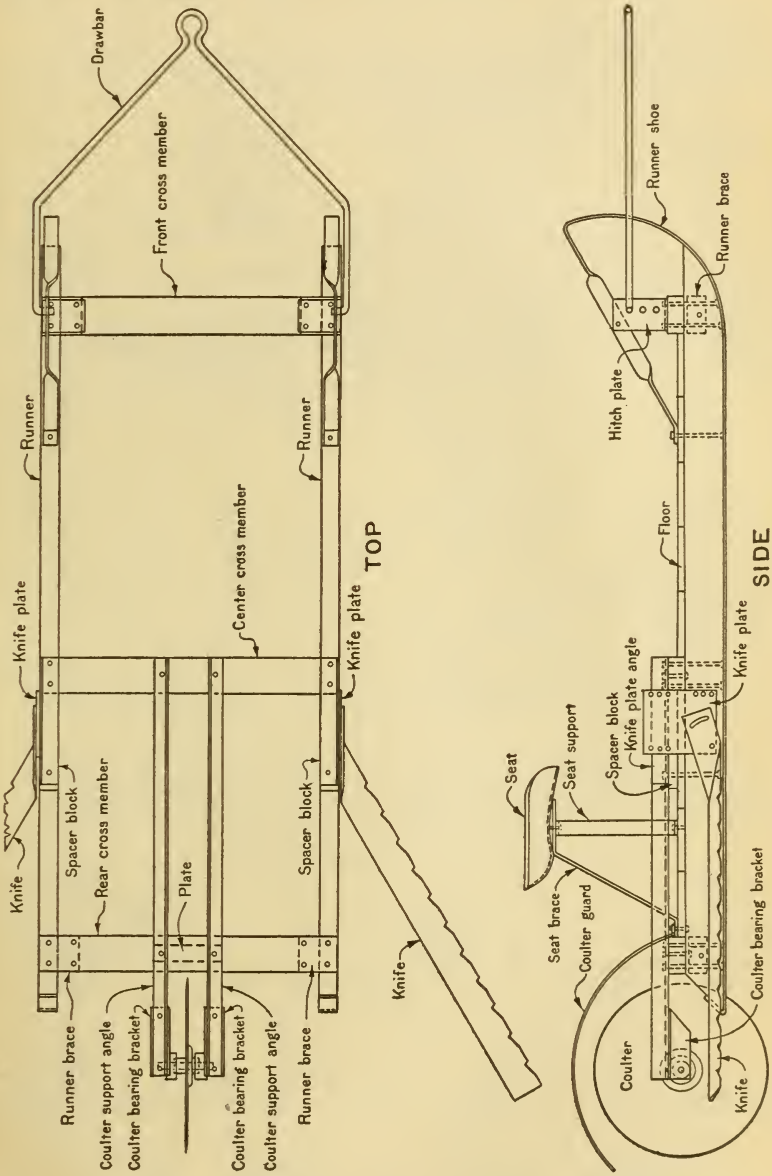

FIGURE 4.—Assembly (top and side views). In the top view the coulter guard, floor, seat, seat brace, and seat support are not shown

HOW TO BUILD THE STALK SHAVER

All the materials required for making this implement are listed in Table 1. Some of the pieces may be found in the machine shed or elsewhere on the farm. The dimensions given in the table are for the finished pieces, the lumber being dressed on all sides. The parts of the shaver are named in the assembly drawings. (Fig. 4.)

TABLE 1.—*Bill of material for sled-type stalk shaver*

Number of pieces	Material	Size of piece [1]	Used for—	Figure No.
2	Yellow pine	3½ by 1½ by 72 inches	Runners	5
3	do	3½ by 1½ by 28 inches	Cross members	6, 7, 8
4	do	11½ by ¾ by 28 inches	Floor	
1	do	7 by ¾ by 28 inches	do	
2	do	1½ by ¾ by 9 inches	Spacer blocks	9
2	Strap steel	1½ by 3/16 by 110 inches	Runner shoes	13
2	Mild steel	3 by ¼ by 9 inches	Hitch plates	11
2	do	6 by ¼ by 6¾ inches	Knife plates	14
1	do	4 by ⅛ by 26 inches	Coulter guard	20
1	do	1½ by ¼ by 33 inches	Seat support	21
1	do	1½ by ¼ by 20 inches	Seat brace	19
1	do	1½ by 3/16 inches; length determined by type of coulter.	Reinforcing plate	17
1	do	⅝ by 72 inches	Drawbar	22
1	do	Diameter and length determined by type of coulter.	Coulter axle shaft	
4	Steel angle	2 by 2 by 3/16 by 3½ inches	Runner braces	12
2	do	2 by 2 by 3/16 by 6½ inches	Coulter bearing brackets	18
2	do	1½ by 1½ by 3/16 by 39½ inches	Coulter support angles	16
2	do	1½ by 1½ by 3/16 by 12 inches	Knife plate angles	10
1	Steel	15 inches diameter	Coulter with hub and bearings	
1	do		Seat	
[2] 2	do	40-inch lister cultivator blades	Knives	15
16	Carriage bolts	5/16 by 5½ inches		
8	do	5/16 by 2¼ inches		
3	do	5/16 by 2 inches		
2	do	⅜ by 3 inches		
2	do	⅜ by 2¼ inches		
1	do	7/16 by 1¼ inches		
4	Machine bolts	5/16 by 2¼ inches		
2	do	⅜ by 3 inches		
4	do	⅜ by 2 inches		
6	do	⅜ by 1 inch		
4	Plow bolts (flat head, square shank).	do		
4	Flat washers	5/16 inch		
16	Wood screws	No. 10 by 1½ inch		
2	Cotter keys	3/16 by 1¼ inch		

[1] Finished dimensions; rough lumber will be somewhat larger.

[2] A pair of right and left blades.

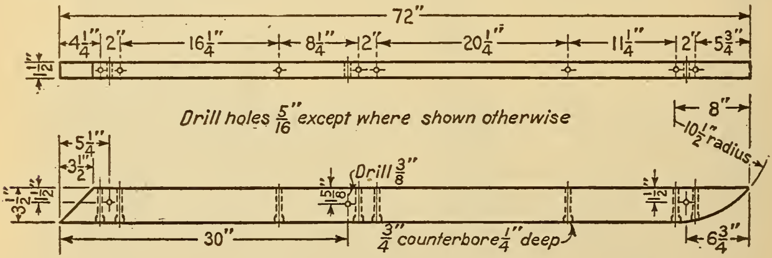

FIGURE 5.—Runner (make two alike)

Each of the parts is to be cut and drilled carefully according to the dimensions given in Figures 5 to 22. The steel parts, consisting

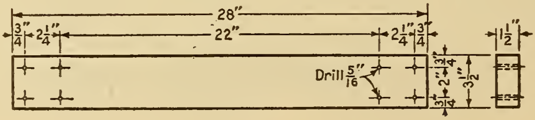

FIGURE 6.—Front cross member (make one)

of runner shoes (fig. 13), seat brace (fig. 19), coulter guard (fig. 20), and seat support (fig. 21), may be most easily shaped by first chalking

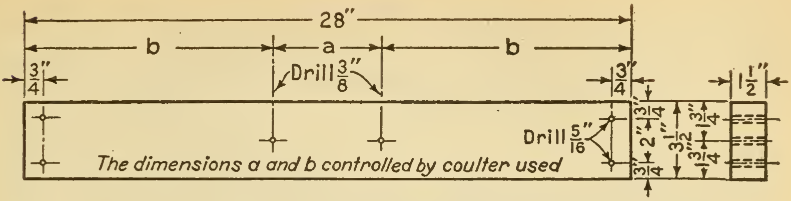

FIGURE 7.—Center cross member (make one)

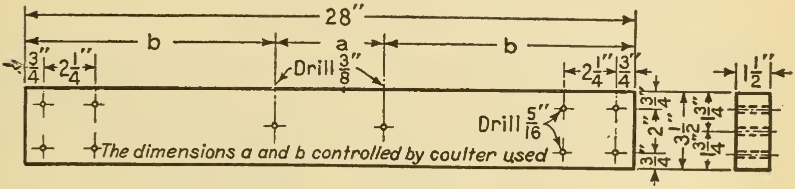

FIGURE 8.—Rear cross member (make one)

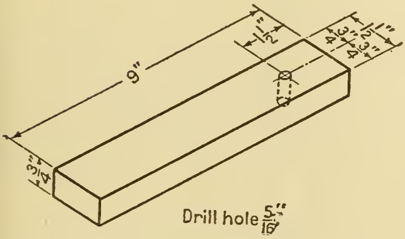

FIGURE 9.—Spacer block (make two alike)

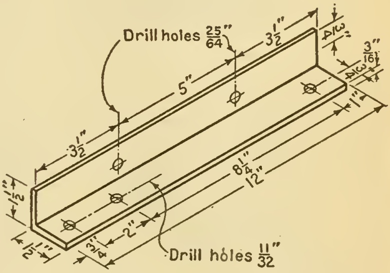

FIGURE 10.—Knife plate angle (make one right and one left; right shown)

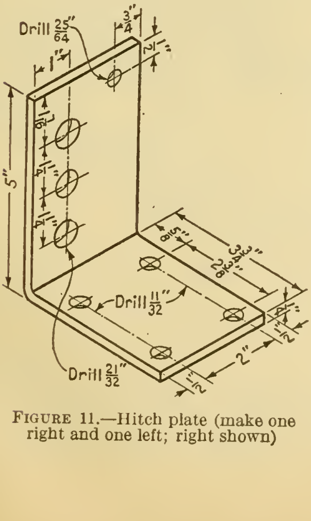

FIGURE 11.—Hitch plate (make one right and one left; right shown)

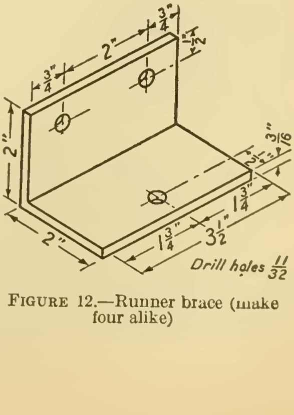

FIGURE 12.—Runner brace (make four alike)

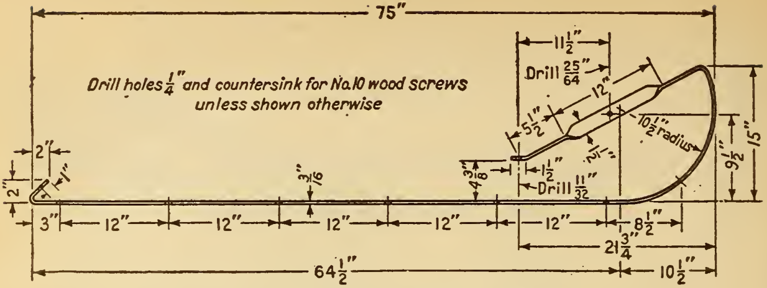

Figure 13.—Runner shoe (make two alike)

or penciling out full-size drawings on a level wooden or concrete floor and bending the metal to fit these drawings. Heating of the steel to a dull cherry red facilitates bending.

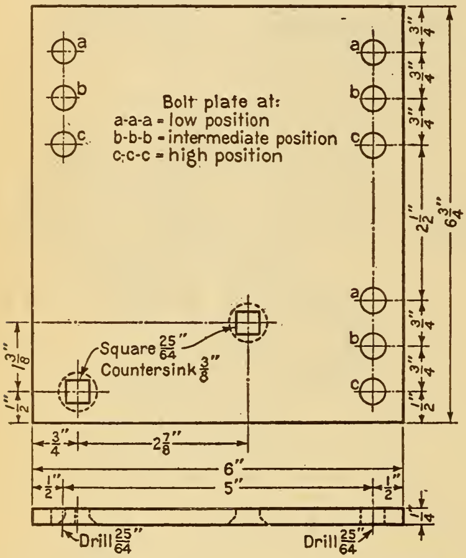

Figure 14.—Knife plate (make one right and one left; right shown)

The knives (fig. 15) are 40-inch lister cultivator blades made by the John Deere Co. The serrations may be ground in the edge with an emery wheel, the grinding being done from the under side. Any type of coulter may be used that can be held in place. A bolt of proper size may be used for the coulter axle shaft. The diameter of this shaft will be determined by the size of the hole in the coulter bearings, and the length must be sufficient to pass through the bearing brackets. The distance *a* between bolt holes in the center and rear cross members (figs. 7 and 8) and in the reinforcing plate (fig. 17) must be determined according to the over-all length of the coulter hub and bearings.

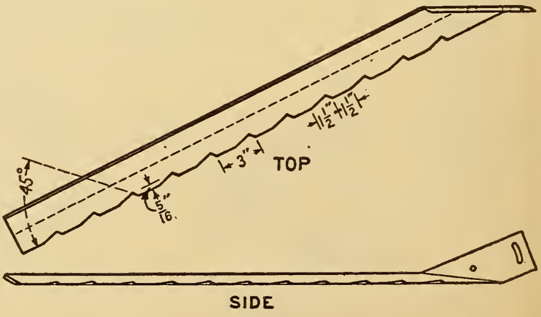

Figure 15.—Knife (make one right and one left; right shown)

The parts of this stalk shaver may be put together as follows:

Insert the 5/16 by 5½ inch carriage bolts into the runners (fig. 5) from below and place the cross members (figs. 6, 7, and 8) in position. Lay the floor boards between the cross members and nail them to the runners. Put a spacer block (fig. 9) over each runner just back of the center cross member, with rear end fitting on runner bolt, and nail it down. Bolt down the rear cross member to the runner, using the washers here. Place the knife plate angles (fig. 10) and the hitch plates (fig. 11) in position (one of each over each runner) and bolt them to the runners. Next bolt two of the runner braces (fig. 12) to the rear cross member and the runners, using 5/16 by 2¼ inch carriage bolts through both runners and cross members. Then bolt the other two runner braces to the front cross member and runners, using a 5/16 by 2¼ inch carriage bolt through each runner and 5/16 by 2¼ inch machine bolts through the cross member and hitch plate.

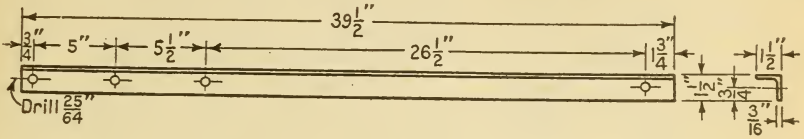

FIGURE 16.—Coulter support angle (make one right and one left; right shown)

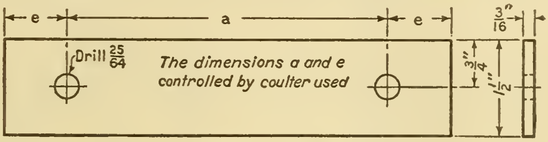

FIGURE 17.—Reinforcing plate (make one)

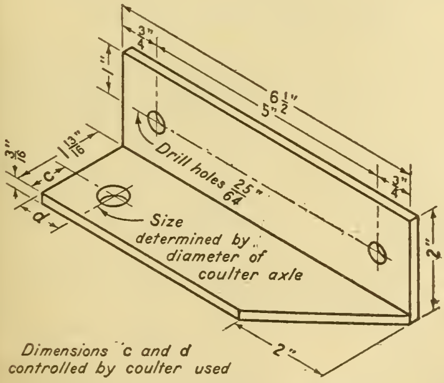
¾"
1"
6½"
5"
13/16"
3/16"
c
d
Drill holes 25/64"
¾"
2"
Size determined by diameter of coulter axle
2"
Dimensions c and d controlled by coulter used

FIGURE 18.—Coulter bearing bracket (make one right and one left; right shown)

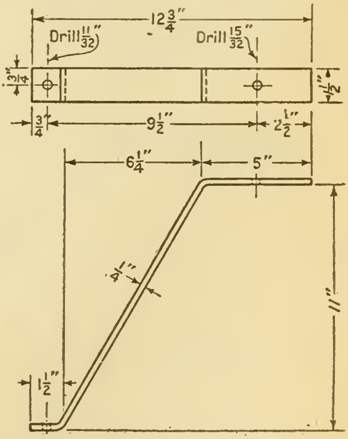

FIGURE 19.—Seat brace (make one)

Secure the runner shoes (fig. 13) to the runners with the No. 10 1½-inch wood screws. Bolt the extension of the front end to the runner and to the hitch plate, using ⅜ by 1 inch machine bolts at the hitch plates. Insert the ⅜ by 1 inch square-shank plow bolts into

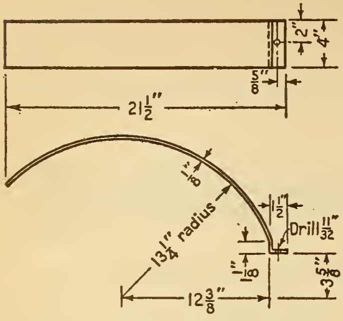

FIGURE 20.—Coulter guard (make one)

the countersunk holes in the knife plates (fig. 14), and bolt the latter to the sides of the runners with ⅜ by 2¼ inch carriage bolts and to the knife plate angles with ⅜ by 1 inch machine bolts. Attach the knives (fig. 15) to the projecting plow bolts.

Bolt the two coulter support angles (fig. 16) to the center cross member with ⅜ by 3 inch carriage bolts and to the rear cross member with ⅜ by 3 inch machine bolts, which are passed first through the reinforcing plate (fig. 17) on the underside of the rear cross member. Bolt the coulter bearing brackets (fig. 18) to the underside of the coulter support angles with ⅜ by 2 inch machine bolts. Place the coulter with its hub and bearings between the bearing brackets and insert the axle shaft; fasten the shaft firmly in position, but loosely enough that coulter will turn freely.

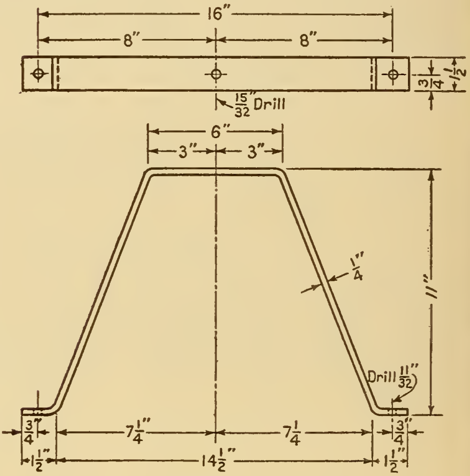

FIGURE 21.—Seat support (make one)

Bolt the lower end of seat brace (fig. 19) and coulter guard (fig. 20) to the floor of the sled, against the center of the rear cross member as shown in Figure 4, with a 5/16 by 2 inch carriage bolt. Place the seat support (fig. 21) under the other end of the seat brace, and bolt it to the floor with 5/16 by 2 inch carriage bolts. Bolt the seat on top with a 7/16 by 1¼ inch carriage bolt. Any implement seat may be used. Install the drawbar (fig. 22), using the 3/16 by 1¼ inch cotter keys to hold it in place.

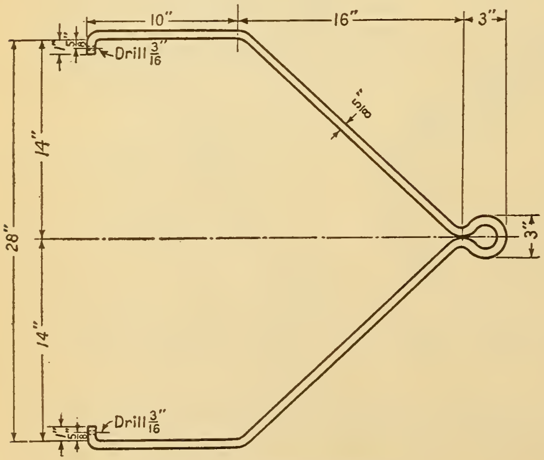

FIGURE 22.—Drawbar (make one)

OPERATING ADJUSTMENTS

The knives must be set to run at or slightly below the ground surface, the blade sloping slightly downward toward the rear or outer end. The drawbar should be adjusted in the hitch plates to hold the front of the sled down and prevent side whipping.

The coulter must run sufficiently deep in the soil to hold the rear of the shaver steadily between the rows. This depth can be adjusted by means of wooden blocks. To raise the coulter, place blocks 2 inches wide and of the required thickness under the coulter support angles on the center and the rear cross members. To lower the coulter, place a block 2 inches wide and of the required thickness between each coulter-bearing bracket and the coulter support angle to which it is fastened. Care should be used to mount the coulter blade parallel to the runners.

For best results, it is necessary to pull the shaver between the two rows dropped simultaneously by the planter.

TWO-SHAVER 4-ROW UNIT

Two sleds may be drawn as a 4-row unit by using a special 3-horse hitch for horses or a cross bar rigidly attached to a tractor. When using horses the driver sits on one sled and has a weight (a sack of sand is satisfactory) about equal to his own weight on the other sled. When using a tractor, a sack of sand or other weight is placed on each sled while the driver rides the tractor.

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